Economic Analysis Report

2021 SAA Proposal Window to Support NJ OSW

September 19, 2022

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The information contained herein is based on information provided in project proposals submitted to PJM by third parties through its 2021 SAA Proposal Window. PJM analyzed such information for the purpose of identifying potential solutions for NJ BPU's consideration as contemplated under the SAA Agreement, FERC Rate Schedule No. 49. Any decision made using this information should be based upon independent review and analysis, and shall not form the basis of any claim against PJM.

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EXECUTIVE SUMMARY

Background

As part of the 2021 SAA Proposal Window to support NJ Offshore Wind ("OSW"), PJM received proposals to meet New Jersey's goal of interconnecting up to 7,500 MW of offshore wind. The proposals were categorized into four options according to the function and location of the proposal. Altogether, PJM received a diverse set of 80 proposals.

- Option 1a proposals: Onshore transmission upgrades to resolve potential reliability criteria violations on PJM facilities in accordance with all applicable planning criteria (PJM, NERC, SERC, RFC, and Local Transmission Owner criteria).
- Option 1b proposals: Onshore new transmission connection facilities
- Option 2 proposals: Offshore new transmission connection facilities
- Option 3 proposals: Offshore new transmission network facilities[1]

Offshore Wind Scenarios

PJM worked with the NJBPU to create OSW scenarios involving various combinations of the submitted Option1b and Option 2 proposals. Each scenario contains the awarded NJ Solicitation #1 for 1,100 MW and NJ Solicitation #2 for 2,658 MW. While the scope for the submission of proposals did not allow alternative points of injection (POIs) for NJ Solicitation #1, it did allow alternative POIs for NJ Solicitation #2. For the purpose of this report, a selected scenario included a combination of a selected transmission package along with the corresponding OSW generation injection it supported.

PJM performed initial reliability screening of these scenarios and selected a subset for economic analysis. Therefore, each scenario was vetted by PJM for reliability concerns prior to the economic analysis. Tables 1 and 2 illustrate the POI locations and MW injection amounts for the scenarios selected for economic analysis. The Appendix A to this report provides detailed energy market simulation results for each scenario.

[1] In the context of this report, no Option 3 Proposals were analyzed for economic benefits

Table 1. Table 1. POI Scenarios - Option 1b Only

		Alt POI	Default POI	Alt POI	Alt POI	Default POI	Alt POI	Default POI	Alt POI
Scenarios	Total (MW)	New Freedom 500 kV	Cardiff 230 kV	Half Acre 500 kV	Lighthouse 500 kV	Smithburg 500 kV	Atlantic 230 kV	Larrabee 230 kV	Werner 230 kV
2a	6258	-	2658	-	-	1200	1200	1200	-
3	6458	1148	1510	2200	-	-	-	1200	400
12	6400	-	1510	-	4890	-	-	-	-
13	6400	-	1510	-	4890	-	-	-	-
14	6400	-	1510	2400	-	1690	-	-	800
18	6310	-	1510	-	-	2400	1200	1200	-

Note 1: All POI Scenarios include Solicitation #1 (1,100 MW), which has been subtracted from the total MW.
Note 2: All MW assumed to be injected at the offshore platform.
Note 3: All POI Scenarios include Option 1a transmission upgrades.

Table 2. POI Scenarios - Option 1b/2

		Alt POI	Default POI	Alt POI	Default POI	Alt POI	Default POI	Alt POI	Default POI	Alt POI	Alt POI	Alt POI
Scenarios	Total (MW)	Reega 230 kV	Cardiff 230 kV	Fresh Ponds 500 kV	Deans 500 kV	Lighthouse 500 kV	Smithburg 500 kV	Atlantic 230 kV	Larrabee 230 kV	Neptune 230 kV	Sewaren 230 kV	Werner 230 kV
1.2	6310	-	1510	-	1200	-	2400	-	1200	-	-	-
1.2a	6400	-	1510	-	1342	-	2348	-	1200	-	-	-
4	6410	-	1510	3000	-	-	-	-	-	1500	-	400
4a	6400	-	1510	2242	-	-	1148	-	-	1500	-	-
5	6310	-	1510	-	-	-	2400	1200	1200	-	-	-
6	6400	-	1510	-	-	4890	-	-	-	-	-	-
7	6400	-	1510	-	-	4890	-	-	-	-	-	-
10	6400	-	1510	-	2290	-	-	-	1200	-	1400	-
11	6399	-	1510	-	1247	-	1148	-	1247	-	1247	-
15	6400	-	1510	4890	-	-	-	-	-	-	-	-
16	6400	2658	-	3742	-	-	-	-	-	-	-	-
16a	6400	-	1510	3742	-	-	1148	-	-	-	-	-
17	6400	-	1510	-	1890	-	-	-	-	3000	-	-
19	6258	-	1510	-	3600	-	1148	-	-	-	-	-

		Alt POI	Default POI	Alt POI	Default POI	Alt POI	Default POI	Alt POI	Default POI	Alt POI	Alt POI	Alt POI
Scenarios	Total (MW)	Reega 230 kV	Cardiff 230 kV	Fresh Ponds 500 kV	Deans 500 kV	Lighthouse 500 kV	Smithburg 500 kV	Atlantic 230 kV	Larrabee 230 kV	Neptune 230 kV	Sewaren 230 kV	Werner 230 kV
20	6400	-	1510	1342	-	-	1148	-	-	2400	-	-
20a	6400	-	1510	-	1342	-	1148	-	-	2400	-	-

Note 1: All POI Scenarios include Solicitation #1 (1,100 MW), which has been subtracted from the total MW.
Note 2: All MW assumed to be injected at the offshore platform.
Note 3: All POI Scenarios include Option 1a transmission upgrades.

Objective

PJM performed various market simulations to evaluate the economic performance of selected offshore wind injection scenarios, focusing on key New Jersey market metrics. The objective of the analysis was to evaluate the potential relative market performance benefits of the competing transmission proposals.

Summary of Findings

PJM performed energy market simulations to evaluate the economic performance of selected offshore wind scenarios on key New Jersey market metrics. The PJM analysis utilized PROMOD, a production cost simulation software, which incorporates extensive market modeling details. These include generating unit operating constraints and economic characteristics, transmission grid topology and fundamental forecasts of market conditions. For each scenario, PJM provided the following outputs from the energy market simulations: Gross Load Payments and load-weighted LMPs for zones of interest to the NJ BPU; unit summary level annual energy and curtailment, generation-weighted LMPs and energy market value of New Jersey's OSW POIs; estimated emissions in New Jersey; PJM-wide production costs.

A key takeaway from the analysis is that while there are some differences between results from scenarios, they may not be, at a decisional level, significant. For example, for the Option 1b category, the largest difference in NJ Load Payments between two scenarios is 0.11%, and the largest difference in POI Annual Average LMP is 2.16%. For the Option 1b/2 category, the same metrics are 0.43% and 4.24% respectively. Also worth noting is that some scenarios result in curtailments at various POIs. Detailed simulation results for completed scenarios can be found in Appendix A – Energy Market Results.

Some of the scenarios included in analysis created POI unit curtailment or increased congestion at nearby locations. For these scenarios, PJM tested additional transmission upgrades to determine if they mitigate this increased congestion within the simulations. These additional upgrades are optional, that is not required as a result of the reliability analysis.

Depending on the results of the reliability analysis performed on the final scenarios selected by NJ BPU, additional economic analyses may be needed.

PJM also evaluated the potential for Incremental Auction Revenue Rights (IARRs) created by the transmission upgrades using the current process for Regional Transmission Expansion Plan (RTEP) Incremental Rights-Eligible Required Transmission Enhancements. The analysis performed indicated no available IARRs for any of the proposals analyzed. (See Appendix B for additional IARR analysis detail).

At the time of this report no capacity market simulations were yet performed. As part of the final analysis PJM will perform capacity market simulations utilizing the most recent Base Residual Auction (BRA) engine to estimate any reduction in capacity load payments associated with NJ offshore wind capacity injections and any increased Capacity Emergency Transfer Limits (CETL) enabled by the transmission solutions.

NJ SAA PROPOSAL WINDOW ECONOMIC ANALYSES

For the purpose of this window, PJM with guidance and input from the NJ BPU performed a series of analyses to evaluate the economic performance of select OSW scenarios developed in support of the NJ public policy goal to interconnect up to 7,500 MW of offshore wind generation between 2028 and 2035.

The solicitation window was conducted under PJM's State Agreement Approach component of the Regional Transmission Expansion Plan (RTEP). As part of this process, PJM performed and evaluated energy market simulations, evaluated potential Incremental Auction Revenue Rights (IARRs), and will evaluate potential capacity market benefits. This is to support the NJ BPU's evaluation and selection of the most cost effective scenario to achieve its policy goals, in accordance with the evaluation criteria outlined in the SAA Proposal Window Overview.

Energy Market Simulations

PJM undertook 2028 energy market simulations for the New Jersey Offshore Wind Study. These studies were primarily focused on estimating the impact of selected OSW scenarios on key New Jersey market metrics. Additional outputs of the simulations provided to the NJ BPU are listed below.

Overview

PJM's energy market simulation portion of SAA-related economic analysis relies heavily on the market simulation tools that PJM uses for the market efficiency component of the RTEP. PJM Manual 14B and Manual 14F further describe the market efficiency component of the RTEP.

The PJM energy market analysis utilized a production cost simulation tool, PROMOD by Hitachi Energy, which incorporates extensive electric market details. These include generating unit operating characteristics, transmission grid topology and constraints to provide nodal locational marginal price (LMP) forecasting and transmission analysis, fundamental forecasts of market conditions. The PROMOD "base case" used by PJM as the starting point for this analysis included the best available topology (2025 RTEP) and the forecasted 2028 market conditions as used for the 2020/21 Long-Term Window for market efficiency analyses.

PJM created a "Scenario" by adding the combination of a selected transmission package along with the corresponding OSW generation injection it supported.

Energy Market Simulation Outputs

PJM provided the following PROMOD outputs from the 2028 energy market simulations for the base case and all scenario cases to the NJ BPU:

- Estimated Gross Load Payments and load-weighted LMPs for load serving entities of interest to the NJ BPU.
- The generation-weighted LMPs and energy market value of New Jersey's OSW generation being evaluated at the POIs.
- Simulated OSW summary and unit-level energy and curtailments of New Jersey's OSW generation being evaluated.
- Estimated emissions in New Jersey.
- PJM-wide production costs.

Energy Market Simulation Results (At a glance)

Option 1b Only Results

Table 3 summarizes the average generation-weighted LMP and total market value of the NJ OSW POIs by scenario. Table 3 also includes the total unit energy and curtailment of all of NJ's OSW POIs by scenario. See Appendix A for similar detailed tables for each individual POI in each selected scenario. Table 4 includes the PJM-wide production cost for each selected scenario. Tables 5 includes the NJ emissions by selected scenario. Table 6 includes the Gross Load Payments for load serving entities of interest for each selected scenario. Table 7 includes the Load LMPs for load serving entities of interest for each selected scenario.

Tables 3 through 7 include scenario results without the optional market efficiency transmission upgrades.

Table 3. OSW Scenario Summary - Option 1b Only

Scenarios	Generation (MWh)	Curtailment (MWh)	Market Value ($M)	POI LMP ($/MWh)
2a	22,775,056	28,722	$696.05	$30.56
3	23,515,816	16,751	$728.53	$30.98
12	23,321,217	0	$726.30	$31.14
13	23,321,217	0	$726.48	$31.15
14	23,271,326	49,891	$714.39	$30.70
18	22,993,262	0	$717.86	$31.22

Table 4. PJM Production Cost by Scenario - Option 1b Only

Scenarios	PJM Production Cost ($M)
2a	$ 18,872.23
3	$ 18,854.25
12	$ 18,858.04
13	$ 18,856.29
14	$ 18,860.15
18	$ 18,864.49

Table 5. NJ Emissions (Metric Tons) by Scenario - Option 1b Only

Scenarios	PJM SO2 Annual Total	PJM NOx Annual Total	PJM CO2 Annual Total
2a	2,544	1,464	7,161,738
3	2,541	1,464	7,152,373
12	2,550	1,465	7,156,363
13	2,548	1,465	7,155,526
14	2,552	1,466	7,161,417
18	2,554	1,466	7,149,926

Table 6. Zonal Annual Gross Load Payment ($M) by Scenario - Option 1b Only

Scenarios	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP
Base	$360	$857	$1,629	$52	$2,898	$1,700	$1,175	$469	$2,283	$572	$1,417	$593	$1,482
2a	$342	$822	$1,577	$51	$2,792	$1,676	$1,145	$465	$2,266	$556	$1,372	$583	$1,439
3	$344	$825	$1,575	$51	$2,795	$1,675	$1,145	$465	$2,266	$555	$1,370	$582	$1,438
12	$344	$824	$1,574	$51	$2,793	$1,675	$1,145	$465	$2,266	$555	$1,370	$582	$1,438
13	$344	$825	$1,574	$51	$2,794	$1,676	$1,143	$465	$2,266	$555	$1,370	$582	$1,438
14	$344	$822	$1,578	$51	$2,795	$1,675	$1,145	$465	$2,267	$555	$1,373	$582	$1,438
18	$344	$823	$1,576	$51	$2,795	$1,676	$1,146	$465	$2,266	$556	$1,372	$583	$1,439

Table 7. Zonal Load-Weighted LMPs ($/MWh) by Scenario - Option 1b Only

Scenarios	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP
Base	$35.34	$35.89	$35.22	$35.63	$35.44	$33.30	$35.28	$32.40	$33.34	$34.40	$35.02	$32.96	$34.18
2a	$33.61	$34.40	$34.10	$34.94	$34.14	$32.82	$34.40	$32.13	$33.11	$33.44	$33.90	$32.41	$33.20
3	$33.76	$34.53	$34.06	$34.90	$34.18	$32.81	$34.38	$32.12	$33.10	$33.41	$33.86	$32.39	$33.18
12	$33.79	$34.51	$34.04	$34.90	$34.16	$32.82	$34.40	$32.12	$33.10	$33.42	$33.87	$32.39	$33.18
13	$33.81	$34.53	$34.04	$34.91	$34.17	$32.82	$34.34	$32.12	$33.10	$33.42	$33.87	$32.39	$33.18
14	$33.74	$34.42	$34.12	$34.91	$34.17	$32.81	$34.39	$32.13	$33.11	$33.42	$33.93	$32.39	$33.18
18	$33.82	$34.47	$34.08	$34.92	$34.18	$32.82	$34.41	$32.13	$33.11	$33.44	$33.91	$32.40	$33.20

Key Takeaways

There are some scenario differences, but they may not be at a high level significant. The largest difference in NJ Load Payments between two scenarios is 0.11%. The largest difference in POI Annual Average LMP is 2.16%.

Some scenarios result in OSW unit curtailment. The highest scenario annual curtailment is 49,891 MWh, or 0.21% of total annual generation.

Simulation outputs for completed scenarios can be found in Appendix A– Energy Market Results Option 1b Only Proposals.

Optional Upgrades from Energy Market Simulations - Option 1b

For some of the 1b scenarios listed above, PJM tested optional upgrades that could provide additional energy market benefits.

These additional market efficiency upgrades were added to the corresponding scenarios to test if they mitigate specific congestion and curtailment caused by the scenario. Results presented in Appendix A include the additional economic upgrades, if any were identified.

These additional upgrades are optional; that is not required as a result of the reliability analysis. A decision to include them or not in any selected package will be discussed with the NJ BPU. See Table 8 below for a list of scenarios with potential market efficiency (ME) upgrades and estimated cost for Option 1b scenarios.

Table 8. Option 1b Market Efficiency (ME) Upgrades

Scenario	Additional Upgrades	Estimated Cost
2a	East Windsor-Smithburg 230 kV	$75 million
14	Clarksville-Lawrence 230 kV	$19 million

Option 1b/2 Results

Table 9 summarizes the average generation-weighted LMP and total market value of the NJ OSW POIs by scenario. Table 9 also includes the total unit energy and curtailment of all of NJ's OSW POIs by scenario. See Appendix A for similar detailed tables for each individual POI in each selected scenario. Table 10 includes the PJM-wide production cost for each selected scenario. Table 11 includes the NJ emissions by selected scenario. Table 12 includes the Gross Load Payments for load serving entities of interest for each selected scenario. Table 13 includes the Load LMPs for load serving entities of interest for each selected scenario.

Tables 9 through 13 include scenario results without the optional market efficiency transmission upgrades.

Table 9. OSW Scenario Summary - Option 1b/2

Scenarios	Generation (MWh)	Curtailment (MWh)	Market Value ($M)	POI LMP ($/MWh)
1.2	22,900,363	92,899	$691.14	$30.18
1.2a	23,245,913	75,304	705.71	$30.36
4	23,356,955	702	$730.71	$31.28
4a	23,314,533	6,685	$723.91	$31.05
5	22,993,262	0	$717.86	$31.22
6	23,321,217	0	$726.30	$31.14
7	23,321,217	0	$726.48	$31.15
10	23,321,217	0	$733.58	$31.46
11	23,317,575	0	$732.66	$31.42
15	23,321,217	0	$731.42	$31.36
16	23,216,594	4,623	$717.79	$30.78
16a	23,317,893	3,324	$724.98	$31.09
17	23,321,193	24	$723.37	$31.02
19	22,803,778	0	$716.35	$31.41
20	23,309,716	11,502	$721.70	$30.96
20a	23,309,651	11,566	$721.83	$30.97

Table 10. PJM Production Cost by Scenario - Option 1b/2

Scenarios	PJM Production Cost ($M)
1.2	$18,867.37
1.2a	$18,858.77
4	$18,857.00
4a	$18,858.53
5	$18,864.49

Scenarios	PJM Production Cost ($M)
6	$18,858.04
7	$18,856.29
10	$18,857.81
11	$18,857.00
15	$18,854.86
16	$18,857.78
16a	$18,857.02
17	$18,858.27
19	$18,868.99
20	$18,858.94
20a	$18,857.74

Table 11. NJ Emissions (Metric Tons) by Scenario - Option 1b/2

Scenarios	PJM SO2 Annual Total	PJM NOx Annual Total	PJM CO2 Annual Total
1.2	2,554	1,469	7,165,879
1.2a	2,549	1,464	7,155,790
4	2,551	1,462	7,129,594
4a	2,551	1,465	7,151,385
5	2,554	1,466	7,149,926
6	2,550	1,465	7,156,363
7	2,548	1,465	7,155,526
10	2,551	1,465	7,147,313
11	2,552	1,464	7,140,054
15	2,551	1,466	7,176,815
16	2,543	1,467	7,190,574
16a	2,550	1,466	7,175,776
17	2,550	1,462	7,122,435
19	2,552	1,467	7,182,748
20	2,552	1,464	7,133,504
20a	2,552	1,463	7,131,884

Table 12. Zonal Annual Gross Load Payment ($M) by Scenario - Option 1b/2

Scenarios	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP
1.2	$344	$818	$1,575	$51	$2,788	$1,676	$1,146	$465	$2,266	$556	$1,372	$583	$1,439
1.2a	$344	$818	$1,574	$51	$2,787	$1,675	$1,145	$465	$2,266	$555	$1,371	$582	$1,438
4	$345	$824	$1,574	$51	$2,794	$1,675	$1,145	$465	$2,266	$555	$1,371	$582	$1,438
4a	$344	$824	$1,574	$51	$2,793	$1,675	$1,145	$465	$2,266	$555	$1,370	$582	$1,438
5	$344	$823	$1,576	$51	$2,795	$1,676	$1,146	$465	$2,266	$556	$1,372	$583	$1,439
6	$344	$824	$1,574	$51	$2,793	$1,675	$1,145	$465	$2,266	$555	$1,370	$582	$1,438
7	$344	$825	$1,574	$51	$2,794	$1,676	$1,143	$465	$2,266	$555	$1,370	$582	$1,438
10	$345	$827	$1,576	$51	$2,799	$1,677	$1,147	$464	$2,264	$556	$1,374	$583	$1,440
11	$345	$825	$1,573	$51	$2,794	$1,675	$1,145	$464	$2,266	$555	$1,371	$582	$1,438
15	$345	$827	$1,574	$51	$2,798	$1,675	$1,145	$465	$2,266	$555	$1,371	$582	$1,438
16	$342	$828	$1,575	$51	$2,797	$1,675	$1,145	$465	$2,267	$555	$1,370	$582	$1,438
16a	$344	$826	$1,574	$51	$2,796	$1,675	$1,145	$465	$2,266	$555	$1,371	$582	$1,438
17	$344	$822	$1,574	$51	$2,791	$1,675	$1,145	$465	$2,266	$555	$1,371	$582	$1,438
19	$345	$827	$1,576	$51	$2,799	$1,676	$1,146	$465	$2,266	$555	$1,372	$582	$1,439
20	$344	$821	$1,574	$51	$2,790	$1,675	$1,145	$465	$2,265	$555	$1,371	$582	$1,438
20a	$344	$821	$1,574	$51	$2,791	$1,675	$1,145	$465	$2,266	$555	$1,371	$582	$1,438

Table 13. Zonal Load-Weighted LMPs ($/MWh) by Scenario - Option 1b/2

Scenarios	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP
1.2	$33.74	$34.24	$34.06	$34.92	$34.09	$32.83	$34.41	$32.13	$33.11	$33.43	$33.91	$32.40	$33.20
1.2a	$33.73	$34.27	$34.03	$34.90	$34.08	$32.81	$34.39	$32.12	$33.09	$33.41	$33.89	$32.39	$33.17
4	$33.83	$34.50	$34.04	$34.89	$34.16	$32.81	$34.39	$32.12	$33.10	$33.41	$33.88	$32.39	$33.17
4a	$33.79	$34.49	$34.04	$34.90	$34.16	$32.81	$34.39	$32.12	$33.10	$33.41	$33.87	$32.38	$33.18
5	$33.82	$34.47	$34.08	$34.92	$34.18	$32.82	$34.41	$32.13	$33.11	$33.44	$33.91	$32.40	$33.20
6	$33.79	$34.51	$34.04	$34.90	$34.16	$32.82	$34.40	$32.12	$33.10	$33.42	$33.87	$32.39	$33.18
7	$33.81	$34.53	$34.04	$34.91	$34.17	$32.82	$34.34	$32.12	$33.10	$33.42	$33.87	$32.39	$33.18
10	$33.91	$34.63	$34.07	$34.97	$34.23	$32.84	$34.44	$32.10	$33.07	$33.46	$33.95	$32.43	$33.22
11	$33.84	$34.55	$34.02	$34.88	$34.17	$32.81	$34.40	$32.12	$33.10	$33.41	$33.89	$32.38	$33.18
15	$33.86	$34.64	$34.05	$34.90	$34.21	$32.81	$34.40	$32.12	$33.10	$33.41	$33.89	$32.39	$33.17
16	$33.62	$34.66	$34.07	$34.92	$34.20	$32.81	$34.39	$32.13	$33.11	$33.41	$33.86	$32.39	$33.18

Scenarios	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP
16a	$33.82	$34.60	$34.04	$34.89	$34.19	$32.81	$34.39	$32.11	$33.09	$33.40	$33.87	$32.38	$33.17
17	$33.81	$34.40	$34.04	$34.90	$34.14	$32.81	$34.40	$32.12	$33.10	$33.41	$33.89	$32.39	$33.17
19	$33.88	$34.64	$34.07	$34.92	$34.23	$32.82	$34.41	$32.12	$33.10	$33.43	$33.91	$32.40	$33.19
20	$33.80	$34.38	$34.04	$34.89	$34.12	$32.81	$34.40	$32.11	$33.09	$33.41	$33.89	$32.39	$33.17
20a	$33.80	$34.39	$34.04	$34.89	$34.13	$32.81	$34.40	$32.11	$33.09	$33.41	$33.90	$32.39	$33.17

Key Takeaways

There are some scenario differences, but they may not be at a high level significant. The largest difference in NJ Load Payments between two scenarios is 0.43%. The largest difference in POI Annual Average LMP is 4.24%.

Some scenarios result in OSW unit curtailment. The highest scenario annual curtailment is 92,899 MWh, or 0.41% of total annual generation.

Simulation outputs for completed scenarios can be found in Appendix A – Energy Market Results Option 1b/2 Proposals.

Optional Upgrades from Energy Market Simulations - Option 1b/2

For some of the 1b/2 scenarios listed above, PJM tested optional upgrades that could provide addition energy market benefits.

These additional market efficiency upgrades were added to the corresponding scenarios to test if they mitigate specific congestion and curtailment caused by the scenario. Results presented in Appendix A include the additional economic upgrades, if any were identified.

These additional upgrades are optional; that is not required as a result of the reliability analysis. A decision to include them or not in any selected package will be discussed with the NJ BPU. See Table 14 below for a list of scenarios with potential market efficiency (ME) upgrades and estimated cost for Option 1b/2 scenarios.

Table 14. Option 1b/2 Market Efficiency (ME) Upgrades

Scenario	Additional Upgrades	Estimated Cost
1.2	East Windsor-Smithburg 230 kV Smithburg-Deans 500kV	$75 million $13.2 million
1.2a	East Windsor-Smithburg 230 kV Smithburg-Deans 500kV	$75 million $13.2 million
20	East Windsor-Smithburg 230 kV	$75 million
20a	East Windsor-Smithburg 230 kV	$75 million

Market Efficiency Analysis for Finalist Scenarios

The completion of the initial reliability analysis screening, market efficiency analysis and identification of an initial set of onshore upgrades for each scenario was necessary to provide NJ BPU with a comparative framework of preliminary transmission cost estimates for the scenarios under evaluation that considers both the offshore and onshore transmission needs. The NJ BPU will use this information to select one to three scenarios for further, more comprehensive reliability analysis that will consider both a further review of the competitive Option 1a proposal clusters as well as a full set of reliability studies. Additional market efficiency analysis may be needed depending on the results of the final reliability analysis.

RTEP IARR Analysis

Background

Some NJ SAA proposals may be eligible for Allocation of Incremental Auction Revenue Rights (IARRs). PJM used the existing process from the Regional Transmission Expansion Plan (RTEP) for IARRs to perform analyses based on the current IARR model. The process is normally conducted before the Annual ARR Allocation. PJM calculates and allocates those IARRs, if any are created by the upgrade, based on the percentage cost responsibility assigned to Responsible Customers, who are assigned cost responsibility for RTEP upgrades that meet certain criterion.

All IARR products have the following characteristics:

- IARR MWs are awarded for the incremental capability created for the life of the facility or 30 years, whichever is less
- Must be simultaneously feasible with all existing Stage 1 ARRs
- Valued each year based on Annual FTR Auction clearing prices

Addition information on IARR evaluation is described in the PJM Manual 6, Section 4.9.2. This process is performed annually for all IARR-eligible RTEP projects.

IARR Analysis Assumptions

IARR Analysis is based on the current operations/market model and utilizes the Simultaneous Feasibility Test with all requested annual Auction Revenue Rights (ARRs) modeled as generation at source points and load at sink points.

The model and current limiting facilities are posted on the PJM website:

https://www.pjm.com/markets-and-operations/ftr

RTEP IARR Overview

The projects for NJ BPU qualify for RTEP IARR analysis if they are backbone upgrades:

- Baseline 500 kV projects

- Baseline 345 kV double circuit projects

PJM evaluates the constraint most relieved by the RTEP upgrade under study. To that end PJM determines an eligible path and evaluates if IARRs could be awarded:

- Source: aggregate pnode up to ten generator buses
- Sink: zone
- MWs

Calculation Method

The NJ SAA proposals qualify for RTEP IARR analysis if they are backbone upgrades:

- Baseline 500 kV projects
- Baseline 345 kV double circuit projects

PJM performed preliminary IARR analysis on the following projects. See Appendix B for the detailed description of the five projects studied.

- 63 North Delta Option A (Double Circuit)
- 296 North Delta Option B (Series Reactor)
- 203 The Broad Creek - Robinson Run Transmission Project
- 345 New 500 kV Peach Bottom - Conastone Line
- 587 Wiley Rd – Conastone 500 kV Project

PJM determined the constraint most relieved by those upgrades. All five projects evaluated were studied against the Peach Bottom – Conastone constraint.

The source point of the IARR was a new aggregate pricing point comprised of up to ten generator buses having the largest positive distribution factor (DFAX) on the most relieved constraint.

- Source: Hunterstown, Westport, Wagner, Calvert Cliffs

The sink point of the IARR was a new aggregate pricing point comprised of the load-weighted average of the transmission zone for which the aggregate DFAX on the most relieved constraint is negative

- Sink: BGE

IARRs associated with an upgrade are calculated by determining the incremental ARR capability between the source and sink points created by the project.

- Using the base network topology, ARR capability between the specified source-sink combination is measured by increasing MW transfers from the specified source to the specified sink until a transmission limit is encountered.
- Using a network topology which includes the expansion project, the ARR capability between the specified source-sink combination is measured by increasing MW transfers from the specified source to the specified sink until a transmission limit is encountered.
- The incremental ARR (IARR) capability between the source-sink combination created by the expansion project is the difference between the ARR capability in the base system and the ARR capability in the system which includes the project.

IARR Analysis Conclusion

No available IARRs were found for any of the proposals analyzed.

Example of limiting facilities

Pre-Upgrade Limit	Post-Upgrade ARR Capability	Post-Upgrade Limit	IARR MW	Source	Sink
JACK ME 230 KV JAC-TMI l/o L500.Conastone-PeachBottom.5012	0	JACK ME 230 KV JAC-TMI l/o L500.Conastone-PeachBottom.5012	0	Hunterstown, Westport, Wagner, Calvert Cliffs	BGE

The completed limiting facility list (updated annually):

https://pjm.com/-/media/markets-ops/ftr/iarr-limiting-facilities.ashx

APPENDIX A: OFFSHORE WIND SCENARIO ENERGY MARKET SIMULATION RESULTS

OPTION 1B ONLY SCENARIOS

Scenario 2a

Table 15. Scenario 2a POI Summary (MW)

		Alt POI	Default POI	Alt POI	Alt POI	Default POI	Alt POI	Default POI	Alt POI
Scenario	Total (MW)	New Freedom 500 kV	Cardiff 230 kV	Half Acre 500 kV	Lighthouse 500 kV	Smithburg 500 kV	Atlantic 230 kV	Larrabee 230 kV	Werner 230 kV
2a	6258	-	2658	-	-	1200	1200	1200	-

Scenario 2a Results

Table 16. PJM Production Cost - Scenario 2a

Scenario	PJM Production Cost ($M)
2a	$18,872.23

Table 17. NJ Emissions (Metric Tons) – Scenario 2a

Scenario	PJM SO2 Annual Total	PJM NOx Annual Total	PJM CO2 Annual Total
2a	2,544	1,464	7,161,738

Table 18. Zonal Annual Gross Load Payment ($M) - Scenario 2a

Scenario	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP
Base	$360	$857	$1,629	$52	$2,898	$1,700	$1,175	$469	$2,283	$572	$1,417	$593	$1,482
2a	$342	$822	$1,577	$51	$2,792	$1,676	$1,145	$465	$2,266	$556	$1,372	$583	$1,439

Table 19. Zonal Load-Weighted LMPs ($/MWh) - Scenario 2a

Scenario	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP
Base	$35.34	$35.89	$35.22	$35.63	$35.44	$33.30	$35.28	$32.40	$33.34	$34.40	$35.02	$32.96	$34.18
2a	$33.61	$34.40	$34.10	$34.94	$34.14	$32.82	$34.40	$32.13	$33.11	$33.44	$33.90	$32.41	$33.20

Table 20. OSW POI Generation Summary Report – Scenario 2a

Scenario 2A	Generation (MWh)	Curtailment (MWh)	Market Value ($M)	POI LMP ($/MWh)
POI_Atlantic	4,372,242	486	$134.73	$30.82
POI_Cardiff	9,685,593	0	$292.81	$30.23
POI_Larrabee	4,372,728	0	$134.19	$30.69
POI_Smithburg	4,344,493	28,236	$134.31	$30.92
Total	22,775,056	28,722	$696.05	$30.56

Scenario 2a with ME Upgrades Results

For this scenario PJM tested an additional optional market efficiency (ME) upgrade to determine if POI curtailment could be mitigated within the simulations.

Table 21. Scenario 2a Market Efficiency (ME) Upgrades

Scenario	Additional Upgrades	Estimated Cost
2a	East Windsor-Smithburg 230 kV	$75 million

The results below include the additional economic upgrade.

The additional upgrades are optional; that is not required as a result of the reliability analysis. A decision to include it or not in Scenario 2a will be discussed with the NJ BPU.

Table 22. PJM Production Cost - Scenario 2a with ME upgrades

Scenario	PJM Production Cost ($M)
2a	$18,871.39

Table 23. NJ Emissions (Metric Tons) – Scenario 2a with ME upgrades

Scenario	PJM SO2 Annual Total	PJM NOx Annual Total	PJM CO2 Annual Total
2a	2,545	1,464	7,163,126

Table 24. Zonal Annual Gross Load Payment ($M) - Scenario 2a with ME upgrades

Scenario	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP
Base	$360	$857	$1,629	$52	$2,898	$1,700	$1,175	$469	$2,283	$572	$1,417	$593	$1,482
2a	$343	$824	$1,577	$51	$2,794	$1,676	$1,145	$465	$2,266	$556	$1,371	$583	$1,439

Table 25. Zonal Load-Weighted LMPs ($/MWh) - Scenario 2a with ME upgrades

Scenario	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP
Base	$35.34	$35.89	$35.22	$35.63	$35.44	$33.30	$35.28	$32.40	$33.34	$34.40	$35.02	$32.96	$34.18
2a	$33.64	$34.50	$34.10	$34.93	$34.17	$32.82	$34.40	$32.13	$33.11	$33.44	$33.90	$32.41	$33.20

Table 26. OSW POI Generation Summary Report – Scenario 2a with ME Upgrades

Scenario 2A/Upgrades	Generation (MWh)	Curtailment (MWh)	Market Value ($M)	POI LMP ($/MWh)
POI_Atlantic	4,372,728	0	$137.11	$31.35
POI_Cardiff	9,685,593	0	$293.72	$30.33
POI_Larrabee	4,372,728	0	$136.64	$31.25
POI_Smithburg	4,372,728	0	$138.15	$31.59
Total	22,803,778	0	$705.61	$30.94

Scenario 3

Table 27. Scenario 3 POI Summary (MW)

		Alt POI	Default POI	Alt POI	Alt POI	Default POI	Alt POI	Default POI	Alt POI
Scenario	Total (MW)	New Freedom 500 kV	Cardiff 230 kV	Half Acre 500 kV	Lighthouse 500 kV	Smithburg 500 kV	Atlantic 230 kV	Larrabee 230 kV	Werner 230 kV
3	6458	1148	1510	2200	-	-	-	1200	400

Scenario 3 Results

Table 28. PJM Production Cost - Scenario 3

Scenario	PJM Production Cost ($M)
3	$18,854.25

Table 29. NJ Emissions (Metric Tons) – Scenario 3

Scenario	PJM SO2 Annual Total	PJM NOx Annual Total	PJM CO2 Annual Total
3	2,541	1,464	7,152,373

Table 30. Zonal Annual Gross Load Payment ($M) - Scenario 3

Scenario	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP
Base	$360	$857	$1,629	$52	$2,898	$1,700	$1,175	$469	$2,283	$572	$1,417	$593	$1,482
3	$344	$825	$1,575	$51	$2,795	$1,675	$1,145	$465	$2,266	$555	$1,370	$582	$1,438

Table 31. NJ Load-Weighted LMPs ($/MWh) – Scenario 3

Scenario	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP
Base	$35.34	$35.89	$35.22	$35.63	$35.44	$33.30	$35.28	$32.40	$33.34	$34.40	$35.02	$32.96	$34.18
3	$33.76	$34.53	$34.06	$34.90	$34.18	$32.81	$34.38	$32.12	$33.10	$33.41	$33.86	$32.39	$33.18

Table 32. OSW POI Generation Summary Report – Scenario 3

Scenario 3	Generation (MWh)	Curtailment (MWh)	Market Value ($M)	POI LMP ($/MWh)
POI_Cardiff	5,502,349	0	$168.74	$30.67
POI_Deans	8,016,669	0	$252.53	$31.50
POI_Larrabee	4,372,728	0	$137.73	$31.50
POI_New_Freedom	4,183,244	0	$130.68	$31.24
POI_Werner	1,440,825	16,751	$38.85	$26.96
Total	23,515,816	16,751	$728.53	$30.98

Scenario 12

Table 33. Scenario 12 POI Summary (MW)

		Alt POI	Default POI	Alt POI	Alt POI	Default POI	Alt POI	Default POI	Alt POI
Scenarios	Total (MW)	New Freedom 500 kV	Cardiff 230 kV	Half Acre 500 kV	Lighthouse 500 kV	Smithburg 500 kV	Atlantic 230 kV	Larrabee 230 kV	Werner 230 kV
12	6400	-	1510	-	4890	-	-	-	-

Scenario 12 Results

Table 34. PJM Production Cost – Scenario 12

Scenario	PJM Production Cost ($M)
12	$ 18,858.04

Table 35. NJ Emissions (Metric Tons) – Scenario 12

Scenario	PJM SO2 Annual Total	PJM NOx Annual Total	PJM CO2 Annual Total
12	2,550	1,465	7,156,363

Table 36. Zonal Annual Gross Load Payment ($M) - Scenario 12

Scenario	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP
Base	$360	$857	$1,629	$52	$2,898	$1,700	$1,175	$469	$2,283	$572	$1,417	$593	$1,482
12	$344	$824	$1,574	$51	$2,793	$1,675	$1,145	$465	$2,266	$555	$1,370	$582	$1,438

Table 37. NJ Load-Weighted LMPs ($/MWh) – Scenario 12

Scenario	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP
Base	$35.34	$35.89	$35.22	$35.63	$35.44	$33.30	$35.28	$32.40	$33.34	$34.40	$35.02	$32.96	$34.18
12	$33.79	$34.51	$34.04	$34.90	$34.16	$32.82	$34.40	$32.12	$33.10	$33.42	$33.87	$32.39	$33.18

Table 38. OSW POI Generation Summary Report - Scenario 12

Scenario 12	Generation (MWh)	Curtailment (MWh)	Market Value ($M)	POI LMP ($/MWh)
POI_Cardiff	5,502,349	0	$168.94	$30.70
POI_Lighthouse	17,818,868	0	$557.36	$31.28
Total	23,321,217	0	$726.30	$31.14

Scenario 13

Table 39. Scenario 13 POI Summary (MW)

Scenario	Total (MW)	Alt POI Reega 230 kV	Default POI Cardiff 230 kV	Alt POI Fresh Ponds 500 kV	Default POI Deans 500 kV	Alt POI Lighthouse 500 kV	Default POI Smithburg 500 kV	Alt POI Atlantic 230 kV	Default POI Larrabee 230 kV	Alt POI Neptune 230 kV	Alt POI Sewaren 230 kV
13	6400	-	1510	-	-	4890	-	-	-	-	-

Scenario 13 Results

Table 40. PJM Production Cost - Scenario 13

Scenario	PJM Production Cost ($M)
13	$ 18,856.29

Table 41. NJ Emissions (Metric Tons) – Scenario 13

Scenario	PJM SO2 Annual Total	PJM NOx Annual Total	PJM CO2 Annual Total
13	2,548	1,465	7,155,526

Table 42. Zonal Annual Gross Load Payment ($M) - Scenario 13

Scenario	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP
Base	$360	$857	$1,629	$52	$2,898	$1,700	$1,175	$469	$2,283	$572	$1,417	$593	$1,482
13	$344	$825	$1,574	$51	$2,794	$1,676	$1,143	$465	$2,266	$555	$1,370	$582	$1,438

Table 43. NJ Load-Weighted LMPs ($/MWh) – Scenario 13

Scenario	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP
Base	$35.34	$35.89	$35.22	$35.63	$35.44	$33.30	$35.28	$32.40	$33.34	$34.40	$35.02	$32.96	$34.18
13	$33.81	$34.53	$34.04	$34.91	$34.17	$32.82	$34.34	$32.12	$33.10	$33.42	$33.87	$32.39	$33.18

Table 44. OSW POI Generation Summary Report - Scenario 13

Scenario 13	Generation (MWh)	Curtailment (MWh)	Market Value ($M)	POI LMP ($/MWh)
POI_Cardiff	5,502,349	0	$169.26	$30.76
POI_Lighthouse	17,818,868	0	$557.22	$31.27
Total	23,321,217	0	$726.48	$31.15

Scenario 14

Table 45. Scenario 14 POI Summary (MW)

		Alt POI	Default POI	Alt POI	Alt POI	Default POI	Alt POI	Default POI	Alt POI
Scenario	Total (MW)	New Freedom 500 kV	Cardiff 230 kV	Half Acre 500 kV	Lighthouse 500 kV	Smithburg 500 kV	Atlantic 230 kV	Larrabee 230 kV	Werner 230 kV
14	6400	-	1510	2400	-	1690	-	-	800

Scenario 14 Results

Table 46. PJM Production Cost - Scenario 14

Scenario	PJM Production Cost ($M)
14	$18,860.15

Table 47. NJ Emissions (Metric Tons) – Scenario 14

Scenario	PJM SO2 Annual Total	PJM NOx Annual Total	PJM CO2 Annual Total
14	2,552	1,466	7,161,417

Table 48. Zonal Annual Gross Load Payment ($M) - Scenario 14

Scenario	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP
Base	$360	$857	$1,629	$52	$2,898	$1,700	$1,175	$469	$2,283	$572	$1,417	$593	$1,482
14	$344	$822	$1,578	$51	$2,795	$1,675	$1,145	$465	$2,267	$555	$1,373	$582	$1,438

Table 49. Zonal Load-Weighted LMPs ($/MWh) - Scenario 14

Scenario	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP
Base	$35.34	$35.89	$35.22	$35.63	$35.44	$33.30	$35.28	$32.40	$33.34	$34.40	$35.02	$32.96	$34.18
14	$33.74	$34.42	$34.12	$34.91	$34.17	$32.81	$34.39	$32.13	$33.11	$33.42	$33.93	$32.39	$33.18

Table 50. OSW POI Generation Summary Report – Scenario 14

Scenario 2A	Generation (MWh)	Curtailment (MWh)	Market Value ($M)	POI LMP ($/MWh)
POI_Half Acre	8,701,967	43,490	$265.91	$30.56
POI_Cardiff	5,502,349	0	$167.72	$30.48
POI_Werner	2,908,751	6,402	$88.87	$30.55
POI_Smithburg	6,158,260	0	$191.90	$31.16
Total	23,271,326	49,891	$714.39	$30.70

Scenario 14 with ME Upgrades Results

For this scenario PJM tested an additional optional market efficiency (ME) upgrade to determine if POI curtailment could be mitigated within the simulations.

Table 51. Scenario 14 Market Efficiency (ME) Upgrades

Scenario	Additional Upgrades	Estimated Cost
14	East Windsor-Smithburg 230 kV	$75 million

The results below include the additional economic upgrade.

The additional upgrades are optional; that is not required as a result of the reliability analysis. A decision to include it or not in Scenario 14 will be discussed with the NJ BPU.

Table 52. PJM Production Cost - Scenario 14 with ME upgrades

Scenario	PJM Production Cost ($M)
14	$18,858.04

Table 53. NJ Emissions (Metric Tons) – Scenario 14 with ME upgrades

Scenario	PJM SO2 Annual Total	PJM NOx Annual Total	PJM CO2 Annual Total
14	2,550	1,465	7,138,304

Table 54. Zonal Annual Gross Load Payment ($M) - Scenario 14 with ME upgrades

Scenario	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP
Base	$360	$857	$1,629	$52	$2,898	$1,700	$1,175	$469	$2,283	$572	$1,417	$593	$1,482
14	$345	$825	$1,574	$51	$2,795	$1,675	$1,145	$465	$2,266	$555	$1,371	$582	$1,438

Table 55. Zonal Load-Weighted LMPs ($/MWh) - Scenario 14 with ME upgrades

Scenario	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP
Base	$35.34	$35.89	$35.22	$35.63	$35.44	$33.30	$35.28	$32.40	$33.34	$34.40	$35.02	$32.96	$34.18
14	$33.84	$34.55	$34.04	$34.89	$34.18	$32.81	$34.39	$32.12	$33.10	$33.41	$33.88	$32.38	$33.17

Table 56. OSW POI Generation Summary Report – Scenario 14 with ME Upgrades

Scenario 2A/Upgrades	Generation (MWh)	Curtailment (MWh)	Market Value ($M)	POI LMP ($/MWh)
POI_Half Acre	8,745,456	0	$275.59	$31.51
POI_Cardiff	5,502,349	0	$169.57	$30.82
POI_Werner	2,908,504	6,648	$88.97	$30.59
POI_Smithburg	6,158,260	0	$194.05	$31.51
Total	23,314,569	6,648	$728.19	$31.23

Scenario 18

Table 57. Scenario 18 POI Summary (MW)

Scenario	Total (MW)	Alt POI Reega 230 kV	Default POI Cardiff 230 kV	Alt POI Fresh Ponds 500 kV	Default POI Deans 500 kV	Alt POI Lighthouse 500 kV	Default POI Smithburg 500 kV	Alt POI Atlantic 230 kV	Default POI Larrabee 230 kV	Alt POI Neptune 230 kV	Alt POI Sewaren 230 kV
18	6310	-	1510	-	-	-	2400	1200	1200	-	-

Scenario 18 Results

Table 58. PJM Production Cost - Scenario 18

Scenario	PJM Production Cost ($M)
18	$ 18,864.49

Table 59. NJ Emissions (Metric Tons) – Scenario 18

Scenario	PJM SO2 Annual Total	PJM NOx Annual Total	PJM CO2 Annual Total
18	2,554	1,466	7,149,926

Table 60. Zonal Annual Gross Load Payment ($M) - Scenario 18

Scenario	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP
Base	$360	$857	$1,629	$52	$2,898	$1,700	$1,175	$469	$2,283	$572	$1,417	$593	$1,482
18	$344	$823	$1,576	$51	$2,795	$1,676	$1,146	$465	$2,266	$556	$1,372	$583	$1,439

Table 61. NJ Load-Weighted LMPs ($/MWh) – Scenario 18

Scenario	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP
Base	$35.34	$35.89	$35.22	$35.63	$35.44	$33.30	$35.28	$32.40	$33.34	$34.40	$35.02	$32.96	$34.18
18	$33.82	$34.47	$34.08	$34.92	$34.18	$32.82	$34.41	$32.13	$33.11	$33.44	$33.91	$32.40	$33.20

Table 62. OSW POI Generation Summary Report - Scenario 18

Scenario 18	Generation (MWh)	Curtailment (MWh)	Market Value ($M)	POI LMP ($/MWh)
POI_Larrabee	4,372,728	0	$136.47	$31.21
POI_Cardiff	5,502,349	0	$169.13	$30.74
POI_Smithburg	8,745,456	0	$275.37	$31.49
POI_Atlantic	4,372,728	0	$136.88	$31.30
Total	22,993,262	0	$717.86	$31.22

OPTION 1B/2 SCENARIOS

Scenario 1.2

Table 63. Scenario 1.2 POI Summary (MW)

		Alt POI	Default POI	Alt POI	Default POI	Alt POI	Default POI	Alt POI	Default POI	Alt POI	Alt POI	Alt POI
Scenario	Total (MW)	Reega 230 kV	Cardiff 230 kV	Fresh Ponds 500 kV	Deans 500 kV	Lighthouse 500 kV	Smithburg 500 kV	Atlantic 230 kV	Larrabee 230 kV	Neptune 230 kV	Sewaren 230 kV	Warner 230 kV
1.2	6310	-	1510	-	1200	-	2400	-	1200	-	-	-

Scenario 1.2 Results

Table 64. PJM Production Cost - Scenario 1.2

Scenario	PJM Production Cost ($M)
1.2	$18,867.37

Table 65. NJ Emissions (Metric Tons) – Scenario 1.2

Scenario	PJM SO2 Annual Total	PJM NOx Annual Total	PJM CO2 Annual Total
1.2	2,554	1,469	7,165,879

Table 66. Zonal Annual Gross Load Payment ($M) - Scenario 1.2

Scenario	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP
Base	$360	$857	$1,629	$52	$2,898	$1,700	$1,175	$469	$2,283	$572	$1,417	$593	$1,482
1.2	$344	$818	$1,575	$51	$2,788	$1,676	$1,146	$465	$2,266	$556	$1,372	$583	$1,439

Table 67. NJ Load-Weighted LMPs ($/MWh) – Scenario 1.2

Scenario	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP
Base	$35.34	$35.89	$35.22	$35.63	$35.44	$33.30	$35.28	$32.40	$33.34	$34.40	$35.02	$32.96	$34.18
1.2	$33.74	$34.24	$34.06	$34.92	$34.09	$32.83	$34.41	$32.13	$33.11	$33.43	$33.91	$32.40	$33.20

Table 68. OSW POI Generation Summary Report - Scenario 1.2

Scenario 1.2	Generation (MWh)	Curtailment (MWh)	Market Value ($M)	POI LMP ($/MWh)
POI_Deans	4,372,728	0	$138.90	$31.77
POI_Larrabee	4,372,728	0	$129.91	$29.71
POI_Cardiff	5,502,349	0	$167.25	$30.40
POI_Smithburg	8,652,558	92,899	$255.08	$29.48
Total	22,900,363	92,899	$691.14	$30.18

Scenario 1.2 with ME Upgrades Results

For this scenario PJM tested an additional optional market efficiency (ME) upgrade to determine if POI curtailment could be mitigated within the simulations.

Table 69. Scenario 1.2 Market Efficiency (ME) Upgrades

Scenario	Additional Upgrades	Estimated Cost
1.2	East Windsor-Smithburg 230 kV Smithburg-Deans 500kV	$75 million $13.2 million

The results below include the additional economic upgrade.

The additional upgrades are optional; that is not required as a result of the reliability analysis. A decision to include it or not in Scenario 1.2 will be discussed with the NJ BPU.

Table 70. PJM Production Cost - Scenario 1.2 with ME Upgrades

Scenario	PJM Production Cost ($M)
1.2	$ 18,866.08

Table 71. NJ Emissions (Metric Tons) – Scenario 1.2 with ME Upgrades

Scenario	PJM SO2 Annual Total	PJM NOx Annual Total	PJM CO2 Annual Total
1.2	2,554	1,468	7,168,997

Table 72. Zonal Annual Gross Load Payment ($M) - Scenario 1.2 with ME Upgrades

Scenario	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP
Base	$360	$857	$1,629	$52	$2,898	$1,700	$1,175	$469	$2,283	$572	$1,417	$593	$1,482
1.2	$345	$824	$1,575	$51	$2,795	$1,676	$1,146	$465	$2,267	$555	$1,372	$583	$1,439

Table 73. NJ Load-Weighted LMPs ($/MWh) – Scenario 1.2 with ME Upgrades

Scenario	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP
Base	$35.34	$35.89	$35.22	$35.63	$35.44	$33.30	$35.28	$32.40	$33.34	$34.40	$35.02	$32.96	$34.18
1.2	$33.83	$34.50	$34.07	$34.92	$34.18	$32.83	$34.41	$32.13	$33.11	$33.43	$33.91	$32.40	$33.20

Table 74. OSW POI Generation Summary Report - Scenario 1.2 with ME Upgrades

Scenario 1.2/Upgrades	Generation (MWh)	Curtailment (MWh)	Market Value ($M)	POI LMP ($/MWh)
POI_Deans	4,372,728	0	$138.27	$31.62
POI_Larrabee	4,372,728	0	$136.34	$31.18
POI_Cardiff	5,502,349	0	$169.09	$30.73
POI_Smithburg	8,739,112	6,344	$271.96	$31.12
Total	22,986,918	6,344	$715.66	$31.13

Scenario 1.2a

Table 75. Scenario 1.2a POI Summary (MW)

Scenario	Total (MW)	Alt POI Reega 230 kV	Default POI Cardiff 230 kV	Alt POI Fresh Ponds 500	Default POI Deans 500 kV	Alt POI Lighthouse 500 kV	Default POI Smithburg 500 kV	Alt POI Atlantic 230 kV	Default POI Larrabee 230 kV	Alt POI Neptune 230 kV	Alt POI Sewaren 230 kV	Alt POI Warner 230 kV
1.2a	6400	-	1510	-	1342	-	2348	-	1200	-	-	-

Scenario 1.2a Results

Table 76. PJM Production Cost - Scenario 1.2a

Scenario	PJM Production Cost ($M)
1.2a	$18,858.77

Table 77. NJ Emissions (Metric Tons) – Scenario 1.2a

Scenario	PJM SO2 Annual Total	PJM NOx Annual Total	PJM CO2 Annual Total
1.2a	2,549	1,464	7,155,790

Table 78. Zonal Annual Gross Load Payment ($M) - Scenario 1.2a

Scenario	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP
Base	$360	$857	$1,629	$52	$2,898	$1,700	$1,175	$469	$2,283	$572	$1,417	$593	$1,482
1.2a	$344	$818	$1,574	$51	$2,787	$1,675	$1,145	$465	$2,266	$555	$1,371	$582	$1,438

Table 79. NJ Load-Weighted LMPs ($/MWh) – Scenario 1.2a

Scenario	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP
Base	$35.34	$35.89	$35.22	$35.63	$35.44	$33.30	$35.28	$32.40	$33.34	$34.40	$35.02	$32.96	$34.18
1.2a	$33.73	$34.27	$34.03	$34.90	$34.08	$32.81	$34.39	$32.12	$33.09	$33.41	$33.89	$32.39	$33.17

Table 80. OSW POI Generation Summary Report - Scenario 1.2a

Scenario 1.2a	Generation (MWh)	Curtailment (MWh)	Market Value ($M)	POI LMP ($/MWh)
POI_Larrabee	4,372,728	0	$130.94	$29.95
POI_Cardiff	5,502,349	0	$167.43	$30.43
POI_Smithburg	8,480,668	75,304	$252.30	$29.75
POI_Deans	4,890,168	0	$155.04	$31.70
Total	23,245,913	75,304	$705.71	$30.36

Scenario 1.2a with ME Upgrades Results

For this scenario PJM tested an additional optional market efficiency (ME) upgrade to determine if POI curtailment could be mitigated within the simulations.

Table 81. Scenario 1.2a Market Efficiency (ME) Upgrades

Scenario	Additional Upgrades	Estimated Cost
1.2a	East Windsor-Smithburg 230 kV Smithburg-Deans 500kV	$75 million $13.2 million

The results below include the additional economic upgrade.

The additional upgrades are optional; that is not required as a result of the reliability analysis. A decision to include it or not in Scenario 1.2 will be discussed with the NJ BPU

Table 82. PJM Production Cost - Scenario 1.2a with ME Upgrades

Scenario	PJM Production Cost ($M)
1.2a	$18,857.15

Table 83. NJ Emissions (Metric Tons) – Scenario 1.2a with ME Upgrades

Scenario	PJM SO2 Annual Total	PJM NOx Annual Total	PJM CO2 Annual Total
1.2a	2,548	1,466	7,160,717

Table 84. Zonal Annual Gross Load Payment ($M) - Scenario 1.2a with ME Upgrades

Scenario	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP
Base	$360	$857	$1,629	$52	$2,898	$1,700	$1,175	$469	$2,283	$572	$1,417	$593	$1,482
1.2a	$344	$824	$1,574	$51	$2,793	$1,675	$1,145	$465	$2,266	$555	$1,371	$582	$1,438

Table 85. NJ Load-Weighted LMPs ($/MWh) – Scenario 1.2a with ME Upgrades

Scenario	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP
Base	$35.34	$35.89	$35.22	$35.63	$35.44	$33.30	$35.28	$32.40	$33.34	$34.40	$35.02	$32.96	$34.18
1.2a	$33.81	$34.49	$34.04	$34.90	$34.16	$32.81	$34.39	$32.12	$33.10	$33.41	$33.88	$32.39	$33.17

Table 86. OSW POI Generation Summary Report - Scenario 1.2a with ME Upgrades

Scenario 1.2a/Upgrades	Generation (MWh)	Curtailment (MWh)	Market Value ($M)	POI LMP ($/MWh)
POI_Larrabee	4,372,728	0	$136.63	$31.25
POI_Cardiff	5,502,349	0	$169.06	$30.72
POI_Smithburg	8,552,340	3,632	$266.89	$31.21
POI_Deans	4,890,168	0	$154.42	$31.58
Total	23,317,586	3,632	$727.00	$31.18

Scenario 4

Table 87. Scenario 4 POI Summary

		Alt POI	Default POI	Alt POI	Default POI	Alt POI	Default POI	Alt POI	Default POI	Alt POI	Alt POI	Alt POI
Scenario	Total (MW)	Reega 230 kV	Cardiff 230 kV	Fresh Ponds 500 kV	Deans 500 kV	Lighthouse 500 kV	Smithburg 500 kV	Atlantic 230 kV	Larrabee 230 kV	Neptune 230 kV	Sewaren 230 kV	Warner 230 kV
4	6410	-	1510	3000	-	-	-	-	-	1500	-	400

Scenario 4 Results

Table 88. PJM Production Cost - Scenario 4

Scenario	PJM Production Cost ($M)
4	$ 18,857.00

Table 89. NJ Emissions (Metric Tons) – Scenario 4

Scenario	PJM SO2 Annual Total	PJM NOx Annual Total	PJM CO2 Annual Total
4	2,551	1,462	7,129,594

Table 90. Zonal Annual Gross Load Payment ($M) - Scenario 4

Scenario	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP
Base	$360	$857	$1,629	$52	$2,898	$1,700	$1,175	$469	$2,283	$572	$1,417	$593	$1,482
4	$345	$824	$1,574	$51	$2,794	$1,675	$1,145	$465	$2,266	$555	$1,371	$582	$1,438

Table 91. NJ Load-Weighted LMPs ($/MWh) – Scenario 4

Scenario	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP
Base	$35.34	$35.89	$35.22	$35.63	$35.44	$33.30	$35.28	$32.40	$33.34	$34.40	$35.02	$32.96	$34.18
4	$33.83	$34.50	$34.04	$34.89	$34.16	$32.81	$34.39	$32.12	$33.10	$33.41	$33.88	$32.39	$33.17

Table 92. OSW POI Generation Summary Report - Scenario 4

Scenario 4	Generation (MWh)	Curtailment (MWh)	Market Value ($M)	POI LMP ($/MWh)
POI_Fresh Ponds	10,931,118	702	$343.96	$31.47
POI_Cardiff	5,502,349	0	$169.31	$30.77
POI_Werner	1,457,577	0	$46.16	$31.67
POI_Neptune	5,465,910	0	$171.28	$31.34
Total	23,356,955	702	$730.70	$31.28

Scenario 4a

Table 93. Scenario 4a POI Summary (MW)

Scenario	Total (MW)	Alt POI Reega 230 kV	Default POI Cardiff 230 kV	Alt POI Fresh Ponds 500 kV	Default POI Deans 500 kV	Alt POI Lighthouse 500 kV	Default POI Smithburg 500 kV	Alt POI Atlantic 230 kV	Default POI Larrabee 230 kV	Alt POI Neptune 230 kV	Alt POI Sewaren 230 kV	Alt POI Warner 230 kV
4a	6400	-	1510	2242	-	-	1148	-	-	1500	-	-

Scenario 4a Results

Table 94. PJM Production Cost - Scenario 4a

Scenario	PJM Production Cost ($M)
4a	$18,858.53

Table 95. NJ Emissions (Metric Tons) – Scenario 4a

Scenario	PJM SO2 Annual Total	PJM NOx Annual Total	PJM CO2 Annual Total
4a	2,551	1,465	7,151,385

Table 96. Zonal Annual Gross Load Payment ($M) - Scenario 4a

Scenario	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP
Base	$360	$857	$1,629	$52	$2,898	$1,700	$1,175	$469	$2,283	$572	$1,417	$593	$1,482
4a	$344	$824	$1,574	$51	$2,793	$1,675	$1,145	$465	$2,266	$555	$1,370	$582	$1,438

Table 97. NJ Load-Weighted LMPs ($/MWh) – Scenario 4a

Scenario	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP
Base	$35.34	$35.89	$35.22	$35.63	$35.44	$33.30	$35.28	$32.40	$33.34	$34.40	$35.02	$32.96	$34.18
4a	$33.79	$34.49	$34.04	$34.90	$34.16	$32.81	$34.39	$32.12	$33.10	$33.41	$33.87	$32.38	$33.18

Table 98. OSW POI Generation Summary Report - Scenario 4a

Scenario 4a	Generation (MWh)	Curtailment (MWh)	Market Value ($M)	POI LMP ($/MWh)
POI_Fresh Ponds	8,163,029	6,685	$254.31	$31.15
POI_Cardiff	5,502,349	0	$168.70	$30.66
POI_Smithburg	4,183,244	0	$130.16	$31.11
POI_Neptune	5,465,910	0	$170.74	$31.24
Total	23,314,533	6,685	$723.91	$31.05

Scenario 5

Table 99. Scenario 5 POI Summary

		Alt POI	Default POI	Alt POI	Default POI	Alt POI	Default POI	Alt POI	Default POI	Alt POI	Alt POI	Alt POI
Scenario	Total (MW)	Reega 230 kV	Cardiff 230 kV	Fresh Ponds 500 kV	Deans 500 kV	Lighthouse 500 kV	Smithburg 500 kV	Atlantic 230 kV	Larrabee 230 kV	Neptune 230 kV	Sewaren 230 kV	Warner 230 kV
5	6310	-	1510	-	-	-	2400	1200	1200	-	-	-

Scenario 5 Results

Table 100. PJM Production Cost - Scenario 5

Scenario	PJM Production Cost ($M)
5	$ 18,864.49

Table 101. NJ Emissions (Metric Tons) – Scenario 5

Scenario	PJM SO2 Annual Total	PJM NOx Annual Total	PJM CO2 Annual Total
5	2,554	1,466	7,149,926

Table 102. Zonal Annual Gross Load Payment ($M) - Scenario 5

Scenario	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP
Base	$360	$857	$1,629	$52	$2,898	$1,700	$1,175	$469	$2,283	$572	$1,417	$593	$1,482
5	$344	$823	$1,576	$51	$2,795	$1,676	$1,146	$465	$2,266	$556	$1,372	$583	$1,439

Table 103. NJ Load-Weighted LMPs ($/MWh) – Scenario 5

Scenario	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP
Base	$35.34	$35.89	$35.22	$35.63	$35.44	$33.30	$35.28	$32.40	$33.34	$34.40	$35.02	$32.96	$34.18
5	$33.82	$34.47	$34.08	$34.92	$34.18	$32.82	$34.41	$32.13	$33.11	$33.44	$33.91	$32.40	$33.20

Table 104. OSW POI Generation Summary Report - Scenario 5

Scenario 5	Generation (MWh)	Curtailment (MWh)	Market Value ($M)	POI LMP ($/MWh)
POI_Larrabee	4,372,728	0	$136.47	$31.21
POI_Cardiff	5,502,349	0	$169.13	$30.74
POI_Smithburg	8,745,456	0	$275.37	$31.49
POI_Atlantic	4,372,728	0	$136.88	$31.30
Total	22,993,262	0	$717.85	$31.22

Scenario 6

Table 105. Scenario 6 POI Summary

Scenario	Total (MW)	Alt POI Reega 230 kV	Default POI Cardiff 230 kV	Alt POI Fresh Ponds 500 kV	Default POI Deans 500 kV	Alt POI Lighthouse 500 kV	Default POI Smithburg 500 kV	Alt POI Atlantic 230 kV	Default POI Larrabee 230 kV	Alt POI Neptune 230 kV	Alt POI Sewaren 230 kV	Alt POI Warner 230 kV
6	6400	-	1510	-	-	4890	-	-	-	-	-	-

Scenario 6 Results

Table 106. PJM Production Cost - Scenario 6

Scenario	PJM Production Cost ($M)
6	$ 18,858.04

Table 107. NJ Emissions (Metric Tons) – Scenario 6

Scenario	PJM SO2 Annual Total	PJM NOx Annual Total	PJM CO2 Annual Total
6	2,550	1,465	7,156,363

Table 108. Zonal Annual Gross Load Payment ($M) - Scenario 6

Scenario	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP
Base	$360	$857	$1,629	$52	$2,898	$1,700	$1,175	$469	$2,283	$572	$1,417	$593	$1,482
6	$344	$824	$1,574	$51	$2,793	$1,675	$1,145	$465	$2,266	$555	$1,370	$582	$1,438

Table 109. NJ Load-Weighted LMPs ($/MWh) – Scenario 6

Scenario	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP
Base	$35.34	$35.89	$35.22	$35.63	$35.44	$33.30	$35.28	$32.40	$33.34	$34.40	$35.02	$32.96	$34.18
6	$33.79	$34.51	$34.04	$34.90	$34.16	$32.82	$34.40	$32.12	$33.10	$33.42	$33.87	$32.39	$33.18

Table 110. OSW POI Generation Summary Report - Scenario 6

Scenario 6	Generation (MWh)	Curtailment (MWh)	Market Value ($M)	POI LMP ($/MWh)
POI_Cardiff	5,502,349	0	$168.94	$30.70
POI_Lighthouse	17,818,868	0	$557.36	$31.28
Total	23,321,217	0	$726.30	$31.14

Scenario 7

Table 111. Scenario 7 POI Summary (MW)

		Alt POI	Default POI	Alt POI	Default POI	Alt POI	Default POI	Alt POI	Default POI	Alt POI	Alt POI	Alt POI
Scenario	Total (MW)	Reega 230 kV	Cardiff 230 kV	Fresh Ponds 500 kV	Deans 500 kV	Lighthouse 500 kV	Smithburg 500 kV	Atlantic 230 kV	Larrabee 230 kV	Neptune 230 kV	Sewaren 230 kV	Warner 230 kV
7	6400	-	1510	-	-	4890	-	-	-	-	-	-

Scenario 7 Results

Table 112. PJM Production Cost - Scenario 7

Scenario	PJM Production Cost ($M)
7	$18,856.29

Table 113. NJ Emissions (Metric Tons) – Scenario 7

Scenario	PJM SO2 Annual Total	PJM NOx Annual Total	PJM CO2 Annual Total
7	2,548	1,465	7,155,526

Table 114. Zonal Annual Gross Load Payment ($M) - Scenario 7

Scenario	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP
Base	$360	$857	$1,629	$52	$2,898	$1,700	$1,175	$469	$2,283	$572	$1,417	$593	$1,482
7	$344	$825	$1,574	$51	$2,794	$1,676	$1,143	$465	$2,266	$555	$1,370	$582	$1,438

Table 115. NJ Load-Weighted LMPs ($/MWh) – Scenario 7

Scenario	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP
Base	$35.34	$35.89	$35.22	$35.63	$35.44	$33.30	$35.28	$32.40	$33.34	$34.40	$35.02	$32.96	$34.18
7	$33.81	$34.53	$34.04	$34.91	$34.17	$32.82	$34.34	$32.12	$33.10	$33.42	$33.87	$32.39	$33.18

Table 116. OSW POI Generation Summary Report - Scenario 7

Scenario 7	Generation (MWh)	Curtailment (MWh)	Market Value ($M)	POI LMP ($/MWh)
POI_Cardiff	5,502,349	-	$169.26	$30.76
POI_Lighthouse	17,818,868	-	$557.22	$31.27
Total	23,321,217	-	$726.48	$31.15

Scenario 10

Table 117. Scenario 10 POI Summary (MW)

		Alt POI	Default POI	Alt POI	Default POI	Alt POI	Default POI	Alt POI	Default POI	Alt POI	Alt POI	Alt POI
Scenario	Total (MW)	Reega 230 kV	Cardiff 230 kV	Fresh Ponds 500 kV	Deans 500 kV	Lighthouse 500 kV	Smithburg 500 kV	Atlantic 230 kV	Larrabee 230 kV	Neptune 230 kV	Sewaren 230 kV	Warner 230 kV
10	6400	-	1510	-	2290	-	-	-	1200	-	1400	-

Scenario 10 Results

Table 118. PJM Production Cost - Scenario 10

Scenario	PJM Production Cost ($M)
10	$18,857.81

Table 119. NJ Emissions (Metric Tons) – Scenario 10

Scenario	PJM SO2 Annual Total	PJM NOx Annual Total	PJM CO2 Annual Total
10	2,551	1,465	7,147,313

Table 120. Zonal Annual Gross Load Payment ($M) - Scenario 10

Scenario	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP
Base	$360	$857	$1,629	$52	$2,898	$1,700	$1,175	$469	$2,283	$572	$1,417	$593	$1,482
10	$345	$827	$1,576	$51	$2,799	$1,677	$1,147	$464	$2,264	$556	$1,374	$583	$1,440

Table 121. NJ Load-Weighted LMPs ($/MWh) – Scenario 10

Scenario	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP
Base	$35.34	$35.89	$35.22	$35.63	$35.44	$33.30	$35.28	$32.40	$33.34	$34.40	$35.02	$32.96	$34.18
10	$33.91	$34.63	$34.07	$34.97	$34.23	$32.84	$34.44	$32.10	$33.07	$33.46	$33.95	$32.43	$33.22

Table 122. OSW POI Generation Summary Report - Scenario 10

Scenario 10	Generation (MWh)	Curtailment (MWh)	Market Value ($M)	POI LMP ($/MWh)
POI_Deans	8,344,623	-	$263.71	$31.60
POI_Larrabee	4,372,728	-	$138.06	$31.57
POI_Cardiff	5,502,349	-	$169.63	$30.83
POI_Sewaren	5,101,516	-	$162.18	$31.79
Total	23,321,217	-	733.58	$31.46

Scenario 11

Table 123. Scenario 11 POI Summary (MW)

		Alt POI	Default POI	Alt POI	Default POI	Alt POI	Default POI	Alt POI	Default POI	Alt POI	Alt POI	Alt POI
Scenario	Total (MW)	Reega 230 kV	Cardiff 230 kV	Fresh Ponds 500	Deans 500 kV	Lighthouse 500 kV	Smithburg 500 kV	Atlantic 230 kV	Larrabee 230 kV	Neptune 230 kV	Sewaren 230 kV	Warner 230 kV
11	6399	-	1510	-	1247	-	1148	-	1247	-	1247	-

Scenario 11 Results

Table 124. PJM Production Cost - Scenario 11

Scenario	PJM Production Cost ($M)
11	$18,857.00

Table 125. NJ Emissions (Metric Tons) – Scenario 11

Scenario	PJM SO2 Annual Total	PJM NOx Annual Total	PJM CO2 Annual Total
11	2,552	1,464	7,140,054

Table 126. Zonal Annual Gross Load Payment ($M) - Scenario 11

Scenario	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP
Base	$360	$857	$1,629	$52	$2,898	$1,700	$1,175	$469	$2,283	$572	$1,417	$593	$1,482
11	$345	$825	$1,573	$51	$2,794	$1,675	$1,145	$465	$2,266	$555	$1,371	$582	$1,438

Table 127. NJ Load-Weighted LMPs ($/MWh) – Scenario 11

Scenario	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP
Base	$35.34	$35.89	$35.22	$35.63	$35.44	$33.30	$35.28	$32.40	$33.34	$34.40	$35.02	$32.96	$34.18
11	$33.84	$34.55	$34.02	$34.88	$34.17	$32.81	$34.40	$32.12	$33.10	$33.41	$33.89	$32.38	$33.18

Table 128. OSW POI Generation Summary Report - Scenario 11

Scenario 11	Generation (MWh)	Curtailment (MWh)	Market Value ($M)	POI LMP ($/MWh)
POI_Cardiff	5,502,349	0	$169.48	$30.80
POI_Deans	4,543,994	0	$143.55	$31.59
POI_Larrabee	4,543,994	0	$143.19	$31.51
POI_Sewaren	4,543,994	0	$144.52	$31.80
POI_Smithburg	4,183,244	0	$131.92	$31.54
Total	23,317,575	0	732.66	$31.42

Scenario 15

Table 129. Scenario 15 POI Summary (MW)

Scenario	Total (MW)	Alt POI Reega 230 kV	Default POI Cardiff 230 kV	Alt POI Fresh Ponds 500 kV	Default POI Deans 500 kV	Alt POI Lighthouse 500 kV	Default POI Smithburg 500 kV	Alt POI Atlantic 230 kV	Default POI Larrabee 230 kV	Alt POI Neptune 230 kV	Alt POI Sewaren 230 kV	Alt POI Warner 230 kV
15	6400	-	1510	4890	-	-	-	-	-	-	-	-

Scenario 15 Results

Table 130. PJM Production Cost - Scenario 15

Scenario	PJM Production Cost ($M)
15	$18,854.86

Table 131. NJ Emissions (Metric Tons) – Scenario 15

Scenario	PJM SO2 Annual Total	PJM NOx Annual Total	PJM CO2 Annual Total
15	2,551	1,466	7,176,815

Table 132. Zonal Annual Gross Load Payment ($M) - Scenario 15

Scenario	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP
Base	$360	$857	$1,629	$52	$2,898	$1,700	$1,175	$469	$2,283	$572	$1,417	$593	$1,482
15	$345	$827	$1,574	$51	$2,798	$1,675	$1,145	$465	$2,266	$555	$1,371	$582	$1,438

Table 133. NJ Load-Weighted LMPs ($/MWh) – Scenario 15

Scenario	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP
Base	$35.34	$35.89	$35.22	$35.63	$35.44	$33.30	$35.28	$32.40	$33.34	$34.40	$35.02	$32.96	$34.18
15	$33.86	$34.64	$34.05	$34.90	$34.21	$32.81	$34.40	$32.12	$33.10	$33.41	$33.89	$32.39	$33.17

Table 134. OSW POI Generation Summary Report - Scenario 15

Scenario 15	Generation (MWh)	Curtailment (MWh)	Market Value ($M)	POI LMP ($/MWh)
POI_Fresh Ponds	17,818,868	0	$561.65	$31.52
POI_Cardiff	5,502,349	0	$169.76	$30.85
Total	23,321,217	0	$731.42	$31.36

Scenario 16

Table 135. Scenario 16 POI Summary (MW)

		Alt POI	Default POI	Alt POI	Default POI	Alt POI	Default POI	Alt POI	Default POI	Alt POI	Alt POI	Alt POI
Scenario	Total (MW)	Reega 230 kV	Cardiff 230 kV	Fresh Ponds 500 kV	Deans 500 kV	Lighthouse 500 kV	Smithburg 500 kV	Atlantic 230 kV	Larrabee 230 kV	Neptune 230 kV	Sewaren 230 kV	Warner 230 kV
16	6400	2658	-	3742	-	-	-	-	-	-	-	-

Scenario 16 Results

Table 136. PJM Production Cost - Scenario 16

Scenario	PJM Production Cost ($M)
16	$18,857.78

Table 137. NJ Emissions (Metric Tons) – Scenario 16

Scenario	PJM SO2 Annual Total	PJM NOx Annual Total	PJM CO2 Annual Total
16	2,543	1,467	7,190,574

Table 138. Zonal Annual Gross Load Payment ($M) - Scenario 16

Scenario	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP
Base	$360	$857	$1,629	$52	$2,898	$1,700	$1,175	$469	$2,283	$572	$1,417	$593	$1,482
16	$342	$828	$1,575	$51	$2,797	$1,675	$1,145	$465	$2,267	$555	$1,370	$582	$1,438

Table 139. NJ Load-Weighted LMPs ($/MWh) – Scenario 16

Scenario	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP
Base	$35.34	$35.89	$35.22	$35.63	$35.44	$33.30	$35.28	$32.40	$33.34	$34.40	$35.02	$32.96	$34.18
16	$33.62	$34.66	$34.07	$34.92	$34.20	$32.81	$34.39	$32.13	$33.11	$33.41	$33.86	$32.39	$33.18

Table 140. OSW POI Generation Summary Report - Scenario 16

Scenario 16	Generation (MWh)	Curtailment (MWh)	Market Value ($M)	POI LMP ($/MWh)
POI_Reega	9,680,970	4,623	$287.16	$29.66
POI_Fresh Ponds	13,635,624	0	$430.64	$31.58
Total	23,316,594	4,623	717.79	$30.78

Scenario 16a

Table 141. Scenario 16a POI Summary (MW)

		Alt POI	Default POI	Alt POI	Default POI	Alt POI	Default POI	Alt POI	Default POI	Alt POI	Alt POI	Alt POI
Scenario	Total (MW)	Reega 230 kV	Cardiff 230 kV	Fresh Ponds 500 kV	Deans 500 kV	Lighthouse 500 kV	Smithburg 500 kV	Atlantic 230 kV	Larrabee 230 kV	Neptune 230 kV	Sewaren 230 kV	Warner 230 kV
16a	6400	-	1510	3742	-	-	1148	-	-	-	-	-

Scenario 16a Results

Table 142. PJM Production Cost - Scenario 16a

Scenario	PJM Production Cost ($M)
16a	$18,857.02

Table 143. NJ Emissions (Metric Tons) – Scenario 16a

Scenario	PJM SO2 Annual Total	PJM NOx Annual Total	PJM CO2 Annual Total
16a	2,550	1,466	7,175,776

Table 144. Zonal Annual Gross Load Payment ($M) - Scenario 16a

Scenario	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP
Base	$360	$857	$1,629	$52	$2,898	$1,700	$1,175	$469	$2,283	$572	$1,417	$593	$1,482
16a	$344	$826	$1,574	$51	$2,796	$1,675	$1,145	$465	$2,266	$555	$1,371	$582	$1,438

Table 145. NJ Load-Weighted LMPs ($/MWh) – Scenario 16a

Scenario	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP
Base	$35.34	$35.89	$35.22	$35.63	$35.44	$33.30	$35.28	$32.40	$33.34	$34.40	$35.02	$32.96	$34.18
16a	$33.82	$34.60	$34.04	$34.89	$34.19	$32.81	$34.39	$32.11	$33.09	$33.40	$33.87	$32.38	$33.17

Table 146. OSW POI Generation Summary Report - Scenario 16a

Scenario 16a	Generation (MWh)	Curtailment (MWh)	Market Value ($M)	POI LMP ($/MWh)
POI_Cardiff	5,502,349	0	$169.14	$30.74
POI_Fresh Ponds	13,632,300	3,324	$425.30	$31.20
POI_Smithburg	4,183,244	0	$130.54	$31.21
Total	23,317,893	3,324	$724.98	$31.09

Scenario 17

Table 147. Scenario 17 POI Summary (MW)

Scenario	Total (MW)	Alt POI Reega 230 kV	Default POI Cardiff 230 kV	Alt POI Fresh Ponds 500 kV	Default POI Deans 500 kV	Alt POI Lighthouse 500 kV	Default POI Smithburg 500 kV	Alt POI Atlantic 230 kV	Default POI Larrabee 230 kV	Alt POI Neptune 230 kV	Alt POI Sewaren 230 kV	Alt POI Warner 230 kV
17	6400	-	1510	-	1890	-	-	-	-	3000	-	-

Scenario 17 Results

Table 148. PJM Production Cost - Scenario 17

Scenario	PJM Production Cost ($M)
17	$18,858.27

Table 149. NJ Emissions (Metric Tons) – Scenario 17

Scenario	PJM SO2 Annual Total	PJM NOx Annual Total	PJM CO2 Annual Total
17	2,550	1,462	7,122,435

Table 150. Zonal Annual Gross Load Payment ($M) - Scenario 17

Scenario	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP
Base	$360	$857	$1,629	$52	$2,898	$1,700	$1,175	$469	$2,283	$572	$1,417	$593	$1,482
17	$344	$822	$1,574	$51	$2,791	$1,675	$1,145	$465	$2,266	$555	$1,371	$582	$1,438

Table 151. NJ Load-Weighted LMPs ($/MWh) – Scenario 17

Scenario	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP
Base	$35.34	$35.89	$35.22	$35.63	$35.44	$33.30	$35.28	$32.40	$33.34	$34.40	$35.02	$32.96	$34.18
17	$33.81	$34.40	$34.04	$34.90	$34.14	$32.81	$34.40	$32.12	$33.10	$33.41	$33.89	$32.39	$33.17

Table 152. OSW POI Generation Summary Report - Scenario 17

Scenario 17	Generation (MWh)	Curtailment (MWh)	Market Value ($M)	POI LMP ($/MWh)
POI_Cardiff	5,502,349	0	$169.10	$30.73
POI_Deans	6,887,047	0	$217.44	$31.57
POI_Neptune	10,931,797	24	$336.83	$30.81
Total	23,321,193	24	723.37	$31.02

Scenario 19

Table 153. Scenario 19 POI Summary (MW)

		Alt POI	Default POI	Alt POI	Default POI	Alt POI	Default POI	Alt POI	Default POI	Alt POI	Alt POI	Alt POI
Scenario	Total (MW)	Reega 230 kV	Cardiff 230 kV	Fresh Ponds 500 kV	Deans 500 kV	Lighthouse 500 kV	Smithburg 500 kV	Atlantic 230 kV	Larrabee 230 kV	Neptune 230 kV	Sewaren 230 kV	Warner 230 kV
19	6258	-	1510	-	3600	-	1148	-	-	-	-	-

Scenario 19 Results

Table 154. PJM Production Cost - Scenario 19

Scenario	PJM Production Cost ($M)
19	$18,868.99

Table 155. NJ Emissions (Metric Tons) – Scenario 19

Scenario	PJM SO2 Annual Total	PJM NOx Annual Total	PJM CO2 Annual Total
19	2,552	1,467	7,182,748

Table 156. Zonal Annual Gross Load Payment ($M) - Scenario 19

Scenario	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP
Base	$360	$857	$1,629	$52	$2,898	$1,700	$1,175	$469	$2,283	$572	$1,417	$593	$1,482
19	$345	$827	$1,576	$51	$2,799	$1,676	$1,146	$465	$2,266	$555	$1,372	$582	$1,439

Table 157. NJ Load-Weighted LMPs ($/MWh) – Scenario 19

Scenario	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP
Base	$35.34	$35.89	$35.22	$35.63	$35.44	$33.30	$35.28	$32.40	$33.34	$34.40	$35.02	$32.96	$34.18
19	$33.88	$34.64	$34.07	$34.92	$34.23	$32.82	$34.41	$32.12	$33.10	$33.43	$33.91	$32.40	$33.19

Table 158. OSW POI Generation Summary Report - Scenario 19

Scenario 19	Generation (MWh)	Curtailment (MWh)	Market Value ($M)	POI LMP ($/MWh)
POI_Cardiff	5,502,349	0	$169.91	$30.88
POI_Deans	13,118,185	0	$414.32	$31.58
POI_Smithburg	4,183,244	0	$132.12	$31.58
Total	22,803,778	0	$716.35	$31.41

Scenario 20

Table 159. Scenario 20 POI Summary (MW)

		Alt POI	Default POI	Alt POI	Default POI	Alt POI	Default POI	Alt POI	Default POI	Alt POI	Alt POI	Alt POI
Scenario	Total (MW)	Reega 230 kV	Cardiff 230 kV	Fresh Ponds 500 kV	Deans 500 kV	Lighthouse 500 kV	Smithburg 500 kV	Atlantic 230 kV	Larrabee 230 kV	Neptune 230 kV	Sewaren 230 kV	Warner 230 kV
20	6400	-	1510	1342	-	-	1148	-	-	2400	-	-

Scenario 20 Results

Table 160. PJM Production Cost - Scenario 20

Scenario	PJM Production Cost ($M)
20	$18,858.38

Table 161. NJ Emissions (Metric Tons) – Scenario 20

Scenario	PJM SO2 Annual Total	PJM NOx Annual Total	PJM CO2 Annual Total
20	2,552	1,464	7,133,504

Table 162. Zonal Annual Gross Load Payment ($M) - Scenario 20

Scenario	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP
Base	$360	$857	$1,629	$52	$2,898	$1,700	$1,175	$469	$2,283	$572	$1,417	$593	$1,482
20	$344	$821	$1,574	$51	$2,790	$1,675	$1,145	$465	$2,265	$555	$1,371	$582	$1,438

Table 163. NJ Load-Weighted LMPs ($/MWh) – Scenario 20

Scenario	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP
Base	$35.34	$35.89	$35.22	$35.63	$35.44	$33.30	$35.28	$32.40	$33.34	$34.40	$35.02	$32.96	$34.18
20	$33.80	$34.38	$34.04	$34.89	$34.12	$32.81	$34.40	$32.11	$33.09	$33.41	$33.89	$32.39	$33.17

Table 164. OSW POI Generation Summary Report - Scenario 20

Scenario 20	Generation (MWh)	Curtailment (MWh)	Market Value ($M)	POI LMP ($/MWh)
POI_Cardiff	5,502,349	0	$168.80	$30.68
POI_Fresh Ponds	4,890,168	0	$154.50	$31.59
POI_Neptune	8,745,150	306	$268.64	$30.72
POI_Smithburg	4,172,048	11,195	$129.76	$31.10
Total	23,309,716	11,502	$721.70	$30.96

Scenario 20 with ME Upgrades Results

For this scenario PJM tested an additional optional market efficiency (ME) upgrade to determine if POI curtailment could be mitigated within the simulations.

Table 165. Scenario 20 Market Efficiency (ME) Upgrades

Scenario	Additional Upgrades	Estimated Cost
20	East Windsor-Smithburg 230 kV	$75 million

The results below include the additional economic upgrade.

The additional upgrades are optional; that is not required as a result of the reliability analysis. A decision to include it or not in Scenario 20 will be discussed with the NJ BPU.

Table 166. PJM Production Cost - Scenario 20 with ME Upgrades

Scenario	PJM Production Cost ($M)
20	$18,858.97

Table 167. NJ Emissions (Metric Tons) – Scenario 20 with ME Upgrades

Scenario	PJM SO2 Annual Total	PJM NOx Annual Total	PJM CO2 Annual Total
20	2,552	1,463	7,131,480

Table 168. Zonal Annual Gross Load Payment ($M) - Scenario 20 with ME Upgrades

Scenario	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP
Base	$360	$857	$1,629	$52	$2,898	$1,700	$1,175	$469	$2,283	$572	$1,417	$593	$1,482
20	$344	$823	$1,574	$51	$2,792	$1,675	$1,145	$465	$2,265	$555	$1,371	$582	$1,438

Table 169. NJ Load-Weighted LMPs ($/MWh) – Scenario 20 with ME Upgrades

Scenario	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP

Base	$35.34	$35.89	$35.22	$35.63	$35.44	$33.30	$35.28	$32.40	$33.34	$34.40	$35.02	$32.96	$34.18
20	$33.82	$34.44	$34.04	$34.89	$34.15	$32.81	$34.40	$32.11	$33.09	$33.41	$33.89	$32.39	$33.17

Table 170. OSW POI Generation Summary Report - Scenario 20 with ME Upgrades

Scenario 20/Upgrades	Generation (MWh)	Curtailment (MWh)	Market Value ($M)	POI LMP ($/MWh)
POI_Cardiff	5,502,349	0	$169.24	$30.76
POI_Fresh Ponds	4,890,168	0	$154.34	$31.56
POI_Neptune	8,745,456	0	$271.31	$31.02
POI_Smithburg	4,183,244	0	$131.70	$31.48
Total	23,321,218	0	$726.59	$31.16

Scenario 20a

Table 171. Scenario 20a POI Summary (MW)

		Alt POI	Default POI	Alt POI	Default POI	Alt POI	Default POI	Alt POI	Default POI	Alt POI	Alt POI	Alt POI
Scenario	Total (MW)	Reega 230 kV	Cardiff 230 kV	Fresh Ponds 500 kV	Deans 500 kV	Lighthouse 500 kV	Smithburg 500 kV	Atlantic 230 kV	Larrabee 230 kV	Neptune 230 kV	Sewaren 230 kV	Warner 230 kV
20a	6400	-	1510	-	1342	-	1148	-	-	2400	-	-

Scenario 20a Results

Table 172. PJM Production Cost - Scenario 20a

Scenario	PJM Production Cost ($M)
20a	$18,857.74

Table 173. NJ Emissions (Metric Tons) – Scenario 20a

Scenario	PJM SO2 Annual Total	PJM NOx Annual Total	PJM CO2 Annual Total
20a	2,552	1,463	7,131,884

Table 174. Zonal Annual Gross Load Payment ($M) - Scenario 20a

Scenario	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP
Base	$360	$857	$1,629	$52	$2,898	$1,700	$1,175	$469	$2,283	$572	$1,417	$593	$1,482
20a	$344	$821	$1,574	$51	$2,791	$1,675	$1,145	$465	$2,266	$555	$1,371	$582	$1,438

Table 175. NJ Load-Weighted LMPs ($/MWh) – Scenario 20a

Scenario	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP
Base	$35.34	$35.89	$35.22	$35.63	$35.44	$33.30	$35.28	$32.40	$33.34	$34.40	$35.02	$32.96	$34.18
20a	$33.80	$34.39	$34.04	$34.89	$34.13	$32.81	$34.40	$32.11	$33.09	$33.41	$33.90	$32.39	$33.17

Table 176. OSW POI Generation Summary Report - Scenario 20a

Scenario 20a	Generation (MWh)	Curtailment (MWh)	Market Value ($M)	POI LMP ($/MWh)
POI_Cardiff	5,502,349	0	$169.82	$30.68
POI_Deans	4,890,168	0	$154.54	$31.60
POI_Neptune	8,745,158	298	$268.69	$30.72
POI_Smithburg	4,171,975	11,268	$129.78	$31.11
Total	23,309,651	11,566	$721.83	$30.97

Scenario 20a with ME Upgrades Results

For this scenario PJM tested an additional optional market efficiency (ME) upgrade to determine if POI curtailment could be mitigated within the simulations.

Table 177. Scenario 20a Market Efficiency (ME) Upgrades

Scenario	Additional Upgrades	Estimated Cost
20a	East Windsor-Smithburg 230 kV	$75 million

The results below include the additional economic upgrade.

The additional upgrades are optional; that is not required as a result of the reliability analysis. A decision to include it or not in Scenario 20a will be discussed with the NJ BPU.

Table 178. PJM Production Cost - Scenario 20a with ME Upgrades

Scenario	PJM Production Cost ($M)
20a	$18,857.63

Table 179. NJ Emissions (Metric Tons) – Scenario 20a with ME Upgrades

Scenario	PJM SO2 Annual Total	PJM NOx Annual Total	PJM CO2 Annual Total
20a	2,552	1,463	7,131,939

Table 180. Zonal Annual Gross Load Payment ($M) - Scenario 20a with ME Upgrades

Scenario	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP
Base	$360	$857	$1,629	$52	$2,898	$1,700	$1,175	$469	$2,283	$572	$1,417	$593	$1,482
20a	$344	$823	$1,574	$51	$2,792	$1,675	$1,145	$465	$2,266	$555	$1,371	$582	$1,438

Table 181. NJ Load-Weighted LMPs ($/MWh) – Scenario 20a with ME Upgrades

Scenario	AECO	JCPL	PSEG	RECO	New Jersey	APS	BGE	DUQ	FE-ATSI	METED	PECO	PENELEC	PLGRP
Base	$35.34	$35.89	$35.22	$35.63	$35.44	$33.30	$35.28	$32.40	$33.34	$34.40	$35.02	$32.96	$34.18
20a	$33.82	$34.44	$34.04	$34.89	$34.15	$32.81	$34.40	$32.11	$33.09	$33.41	$33.89	$32.39	$33.17

Table 182. OSW POI Generation Summary Report - Scenario 20a with ME Upgrades

Scenario 20a/Upgrades	Generation (MWh)	Curtailment (MWh)	Market Value ($M)	POI LMP ($/MWh)
POI_Cardiff	5,502,349	0	$169.25	$30.76
POI_Deans	4,890,168	0	$154.37	$31.57
POI_Neptune	8,745,456	0	$271.35	$31.03
POI_Smithburg	4,183,244	0	$131.72	$31.49
Total	23,321,218	0	$726.69	$31.16

APPENDIX B: Detailed Proposals Studied for IARR Analysis ~~Results~~

~~Proposals Studied~~

Proposal #	Proposal Name	Description
63	North Delta Option A (Double Circuit)	• Build a new station called "North Delta" with two 500/230 kV 1500 MVA transformers and nine breakers (four high side and five low side breakers in ring bus configuration). • Bring two existing lines, Peach Bottom – Delta Power Plant 500 kV and Cooper - Graceton 230 kV, "in and out" of North Delta. • Build a new North Delta – Graceton 230 kV line by rebuilding 6.07 miles of the existing Cooper - Graceton 230 kV line to double circuit. • Install one breaker at Graceton 230 kV to terminate the new line from North Delta.
296	North Delta Option B (Series Reactor)	• Build a new station called "North Delta" with one 500/230 kV 1500 MVA transformer and six breakers (three high side and three low side breakers). • Bring two existing lines, Peach Bottom – Delta Power Plant 500 kV and Cooper - Graceton 230 kV, "in and out" of North Delta. • Rebuild 6.07 miles of the existing Cooper – Graceton 230 kV line as single circuit. • Install a 0.5% (+.005 X) series reactor on the rebuilt North Delta – Graceton 230 kV line at North Delta. • Additionally, upgrade terminal equipment at Peach Bottom 500 kV to increase the Winter ratings of the existing Peach Bottom Conastone 500 kV line.
203	The Broad Creek - Robinson Run Transmission Project	• The Broad Creek - Robinson Run Transmission Project includes: ○ A new Broad Creek 500/230 kV substation that will include a six (6) position breaker and a half arrangement 230 kV yard connected to a three (3) position ring bus configuration 500 kV yard via two (2) transformers. ○ The 230 kV portion of the substation will interconnect the Graceton - Bagley #1 230 kV transmission line and the Graceton - Bagley #2 230 kV transmission line. ○ The 500 kV portion of the substation will connect to the new three (3) position ring bus configuration 500 kV Robinson Run Switching Station via a new 500 kV transmission line. • The 500 kV transmission line will be built in the existing corridor that contains the Graceton – Cooper 230 kV transmission line and the Conastone - Peach Bottom 500 kV transmission line. ○ Graceton - Cooper 230 kV line to be replaced with a double circuit 500/230 kV transmission line.

		• The 500kV transmission line will terminate at the new Robinson Run Switching Station and the 230kV transmission line will continue on to the Cooper Substation.
345	New 500 kV Peach Bottom - Conastone Line	• Build a new 17.23 mile 500 kV line from Peach Bottom station (PECO) to Conastone station (BG&E). • Major equipment upgrades include the installation of 2 breakers at Peach Bottom 500 kV and 1 breaker at Conastone 500 kV to terminate the proposed line.

587	Wiley Rd – Conastone 500 kV Project	• Wiley Rd – Conastone 500 kV Project using adjacent ROW
		• Project Components
		  ○ New Wiley Rd 500 kV substation with ring bus configuration with 3 positions (3 CB).
		  ○ New Wiley Rd - Conastone 500 kV OH.
		  ○ Two Phase Shifting Transformers (PST) at Hope Creek 230 kV substation to prevent downstream overload on Hope-Creek LS Power Ckt. 1 and Ckt. 2
		  ○ Loop in existing Peach Bottom - Delta 500 kV OH line circuit into NEETMA proposed Wiley 500 kV sub, use existing conductors on the section Peach Bottom - Wiley Rd.

~~***Proposal Results***~~

~~No available IARRs were found for any of the proposals analyzed.~~

Document Revision History

9/19/2022 – V1: original version posted